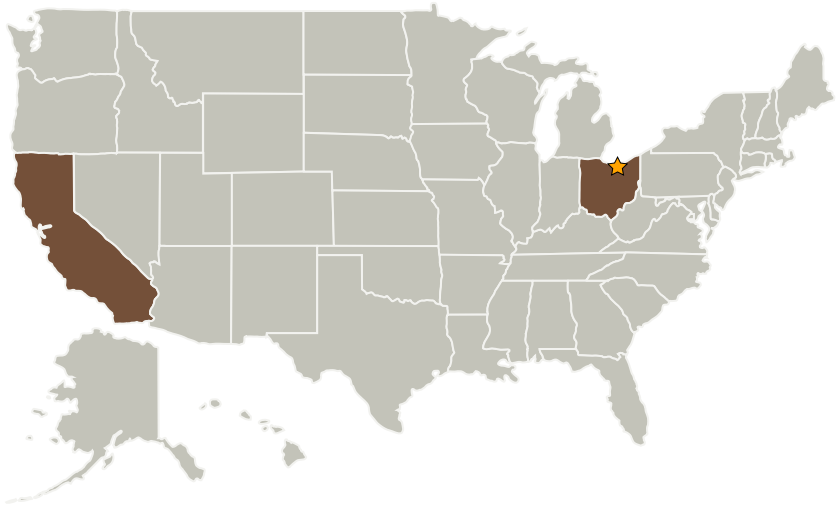
Advanced SiC-Matrix Composites with Improved Oxidation Resistance and Life, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

The objective of this proposed effort is to demonstrate the promise of advanced C/SiC and SiC/SiC composites having improved environmental durability and longer life at higher allowable stress levels without using problematic external barrier coatings. Both oxidation inhibited C/SiC and SiC/SiC composite material systems are proposed for this effort on the basis that: (1) C/SiC offers the highest use temperature and lowest cost of all currently available refractory composite systems, and (2) SiC/SiC offers the highest durability and longest life. Each material system offers unique performance/cost benefits and limitations, and each has been identified as a viable candidate for advanced propulsion and thermal protection system component applications. Oxidation resistant C/SiC and SiC/SiC composite plates will be fabricated incorporating a recently developed, 2nd generation oxidation inhibited matrix produced by chemical vapor infiltration (CVI). Test samples from each material system will be prepared and experimentally evaluated in high-temperature tensile stress oxidation environments. The tensile stress rupture results will be compared to "baseline" uninhibited C/SiC and SiC/SiC composites to establish the performance benefits of the proposed approach.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Hyper-Therm High-Temperature Composites	Supporting Organization	Industry	Huntington Beach, California

Primary U.S. Work Locations	
California	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines